Compact High Power Fiber Laser, Phase I

Completed Technology Project (2006 - 2006)

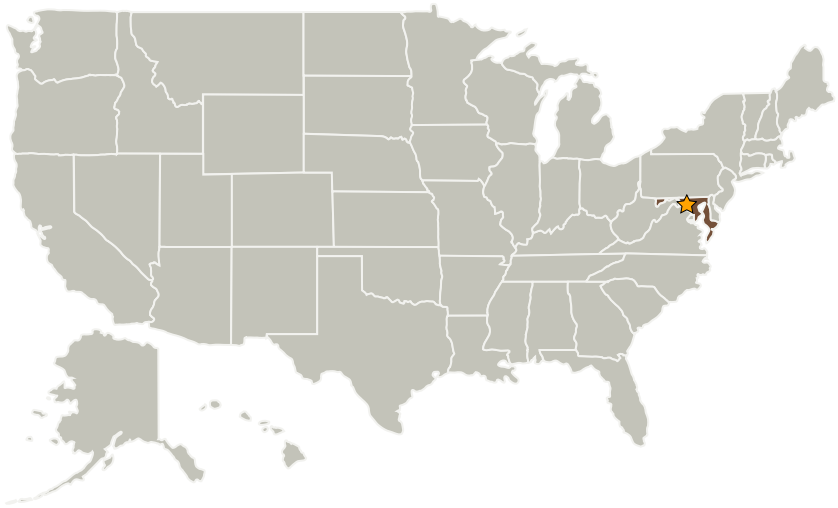
Project Introduction

The goal of the proposed work is the development of a portable and efficient pulsed laser system for LIDAR and ranging applications, which make use of the latest developments in fiber optic technology. Even though there have been significant advances in fiber lasers, there is still a need for development of a reliable fiber laser system generating nanosecond and sub nanosecond (100 ps ? 5 ns) pulses with enough energy for ranging applications. The potential applications of such a laser would be LIDAR systems that are flown in smaller UAV platforms where size and efficiency are key requirements. The proposed laser system follows the classical arrangement of a Master Oscillator Power Amplifier (MOPA). The master oscillator consists of a microchip laser which is a commercially off the shelf (COTS) component. The power amplifier will be constructed using photonic crystal fiber (PCF). Due to the many developments over the last few years in the area of fiber optic technologies and components, Phase I work will start with an in-depth evaluation of all available technologies, which will lead to the design and development of a space-worthy high power nanosecond laser.

Anticipated Benefits

Potential NASA Commercial Applications: Other federal agencies such as NOAA and DoD have express the need of a compact pulsed all solid state laser for ranging, altimetry, and imaging applications.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Sigma Space Corporation	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Lanham, Maryland

Primary U.S. Work Locations
Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jacobo M Sirota

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers